

## A MAGNETIC TUNNEL JUNCTION SENSOR WITH NON-SHUNTING STABILIZATION

### ABSTRACT OF THE DISCLOSURE

5 A magnetic tunnel junction (MTJ) sensor in which the free layer longitudinal biasing elements are coupled, without insulation, to the free layer outside of the MTJ stack to provide reliable non-shunting MTJ free layer stabilization without extremely thin dielectric layers. In one embodiment, hard magnetic (HM) layers are disposed in contact with the free layer outside of and separated from the MTJ stack active region by a thick 10 dielectric layer. In another embodiment, antiferromagnetic (AFM) bias layers are disposed in contact with the free layer outside of and separated from the MTJ stack active region by a thick dielectric layer. In other embodiments, nonconductive HM layers are disposed either in contact with the free layer outside of the MTJ stack active region and/or in abutting contact with the MTJ stack active region.

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